Elyx Member Journey Analytics – Technical Report

🎯 The Big Picture: What This App Accomplishes

Managing a client's long-term health and wellness journey often involves sifting through months of chat logs to track progress, frustrations, and key decisions. This is tedious, error-prone, and inefficient.

Elyx Member Journey Analytics automates this process. By uploading a single chat file, the system transforms raw text into a structured, interactive dashboard.

Key capabilities include:

1. **Conversation Decoding** – Parses chats to identify participants, timestamps, and content.

2. **Journey Structuring** – Organizes the history into biweekly "Episodes" for clarity.

3. **Insight Extraction** – Captures metrics, topics, and emotional states per episode.

4. **AI Summarization** – Provides concise summaries of each two-week period.

5. **Progress Visualization** – Displays trends in sentiment, engagement, and topics through interactive charts.

6. **AI Assistant** – Enables query-based exploration using Retrieval-Augmented Generation (RAG).

⚙️ Core Functions: The Engine Under the Hood

1. Data Handling & Structuring

- **parse_conversation_data(uploaded_file)** → Reads raw logs, extracts sender, timestamp, and message.

- **create_biweekly_episodes(conversations)** → Segments conversations into 14-day "episodes," ensuring a continuous timeline.

2. Episode Analysis Engine

- **analyze_episode(...)** → Coordinates per-episode analysis (participants, topics, sentiment, metrics).

- **detect_topics(conversations)** → Identifies recurring themes such as *diet*, *workout*, *frustration*.

- **calculate_metrics(conversations)** → Computes message counts, ratios, and average team response times.

- **estimate_consultation_time(sender, content)** → Approximates consultation effort using heuristic rules.

- analyze_persona_states(...) & get_sentiment_from_openai(...) → Provides nuanced sentiment analysis via OpenAI.

- generate_episode_summary(conversations) → Uses GPT-4o-mini to create bullet-point summaries.

3. AI Chat Assistant (RAG System) 🤘

- initialize_vectorizer(conversations) → Converts conversation text into TF-IDF vectors.

- transform_query(question) → Expands queries with additional context via LLMs.

- retrieve_relevant_context(question) → Retrieves and re-ranks the most relevant passages using TF-IDF + Cross-Encoder.

- get_chatbot_response(question) → Generates context-grounded answers with GPT-4o-mini.

4. User Interface & Visualizations 📊

- main() → Manages Streamlit app layout and navigation.

- display_episode(...) → Presents structured episode cards with summaries, metrics, and states.

- display_chat_ui() → Builds the Q&A chat interface.

- Visualization Functions → Generate interactive topic charts, Sankey diagrams, and sentiment timelines using Plotly.

🛠 The Development Journey

Iterative UI and Model Development

- **Initial Version:** Focused solely on summarizing the entire chat.

- **Early Metrics:** Randomized outputs tested with OpenRouter APIs (Gemma, Mistral).

- **Optimization:** Transitioned to smaller, faster paid API models for improved responsiveness.

- **Prototype Chatbot:** Introduced RAG for explainable, fact-grounded answers.

Note: Current chatbot does not maintain memory; each query is independent.

Synthetic Data Generation

Creating realistic test data required multiple iterations:

- **Generation:** Initial datasets produced with Gemini Pro using persona-driven prompts.

- **Evaluation & Refinement:** Improved using Perplexity for feedback and ChatGPT-4 for polish.

- **Enhancement:** DeepSeek was used to enrich persona traits and decision rationale.

- **Humanization:** Manual adjustments added natural quirks (family incidents, frustrations, anecdotes) for authenticity.

The final dataset combines Gemini, ChatGPT, DeepSeek, Perplexity, and manual refinement, ensuring both technical accuracy and human realism.

🚀 Why It Matters

Elyx Member Journey Analytics provides:

- **Traceability – Every decision is explainable.**

- **Efficiency – Automates a process that otherwise takes hours.**

- **Insight – Highlights sentiment shifts, engagement levels, and evolving topics.**

- **Transparency – Builds trust through AI explanations grounded in actual data.**

PROMPTS:

Here to generate the text I first ended up with an idea where I will train llms on every individual persona then after looking after the time.I have to use a single LLM(geminai Pro) and provide the prompt to generate the human like texts .The high level plan you proposed I have provided it to the geminai by adding few more context for the week.It generated the text but its not that good .

First Prompt:

Ok you have tocreate a synthetic conversation chat btw a client rohan patel and team namely of the role Ruby (The Concierge / Orchestrator): ,Dr. Warren (The Medical Strategist): ,Advik (The Performance Scientist): ,Carla (The Nutritionist): ,Rachel (The PT / Physiotherapist): tell me yes if you got this

Second Prompt:

here are some restrictions of rohan

1 full diagnostic test panel needs to be done for the member every three

months to check their progress on different biomarkers. - - - - - - -

Assume the member also does some research or reads about health or gets

curious questions about certain topics. So, there should be up to 5

conversations started by the member per week on average.

The member is committing 5 hours per week on average to follow the plan.

Assume exercises are being updated every 2 weeks based on the client's

progress.

The member travels for at least 1 week out of every 4 weeks on business

trips.

The members' primary place of residence is Singapore.

If you are generating report communication, assume you can just have text

messages highlighting either the areas which have problems or tracking of

something which the member or team cares about.

When Elyx proposes a plan, the member sticks to it properly ~50% of the

time. That means ~50% of the time, the plan needs to be changed or

improved based on the members preferences / logistics constraints.

Remember, the member is generally not sick, but they can have 1 chronic

condition that they are managing (eg. high sugar, high BP)

Now the major part after this propsed the conversation that I is present in the ruby.pdf

Then I evaluated it through the perplexity then it told me some suggestions.Then I send this to chatgpt 5 it then wrote the pdf i.e testruby 3 pdf.IN btw this I have also used geminai and perplexity to write the text but while I am doing the evaluation it het worse.

Till Now I have not used DeepSeek Then I used deepseek to get the job done but created one of better solution but its not emotional .It's Like two intellingent people are talking to each other here is the prompt.i have evaluated through the perplexity and send the eaknesses to deepseek prompt.

DeepSeek:

we have to create a syhetic data that is btw a user and a team of experts it is explained in the hackathon pdf now the testruby contains the synthetic data i have created Here is the weaknesses and improvemnts that you have to make Weaknesses (Gaps to Address): Underutilized Requirements ✗ Member persona analysis: No explicit personality/values assessment (e.g., "analytical, driven" from profile). ✗ Internal metrics: Missing tracking of team hours/consults (e.g., "Dr. Warren: 12 hrs/month"). Inconsistent Detail Depth Some test panels lack specifics (e.g., Week 4 "procedural results" vs. Week 6 detailed micronutrients). Limited rationale for certain decisions (e.g., why specific supplements were chosen beyond deficiencies). Travel Disruptions Overemphasized? Travel impacts 25% of weeks, but

interventions sometimes feel repetitive (e.g., recurring jet lag solutions). Missing Problem Statement Elements No "Circadian Optimization Trial" details (Week 24) despite being mentioned. Limited chronic condition management beyond ApoB (e.g., no ongoing BP/sugar tracking). Critical Improvements Needed: Add Persona Nuance Weave in Rohan's "efficiency-driven, analytical" traits (e.g., "Per your preference for data-driven approaches..."). Track Team Metrics Add internal stats (e.g., "Carla: 8 consults/month", "Advik: 15 hrs data analysis"). Deepen Decision Rationales Explicitly link interventions to root causes: "We're adding goblet squats (Step X) because deadlifts risk lumbar strain given your travel-induced back stiffness (Data Y)." Balance Member Initiation Include more spontaneous queries (e.g., "Read about keto – thoughts?" or "Best sleep tracker?"). Clarify Test Procedures Briefly describe key tests (e.g., "DEXA scan measures visceral fat via X-ray absorption"). so incotporate this and write the synthetic data from week 1-10

It is full of too much logic .not too much humanized (final_syntheticdata pdf).Then I again evaluated send this gpt,to improve it more by adding new themes like his children deleted their history,he had afight with his wife etc.

The final data is a combination of multiple iteration using ai tools like chatgpt,deepseek,geminai,perplexity.